INSTITUT FÜR REFRAKTIVE
& OPHTHALMO-CHIRURGIE

Prof. Dr. med. Dr. rer. nat. Theo Seiler
PD Dr. med. Farhad Hafezi
Dr. med. Hans Peter Iseli
PD Dr. rer. medic. Dipl. Ing. Michael Mrochen

IROC AG
Institut für Refraktive und Ophthalmo-Chirurgie

Stockerstrasse 37
CH-8002 Zürich
Tel +41 (0)43 / 488 38 00
Fax +41 (0)43 / 488 38 09
info@iroc.ch www.iroc.ch
MWST-Nr. 655 561

www.assoziatione.keratokono.it
Il presidente
Arch. Benedetto Annunziata

Zürich, 21. Juni 2007/pfi

Dear Mr. Annunziata,

Please excuse my very late reply to your email from May 22nd. I am glad to hear that you have in the meanwhile received my letter from April 2007 where I gave you more information about partial removal of the epithelium and crosslinking in thin corneas. Let me give you some more information regarding these two points:

At the second international corneal crosslinking congress last December in Zurich, we showed the new technique of partial removal to all participants. The second congress was the biggest Crosslinking congress worldwide with more than 230 corneal surgeons from 42 countries. Therefore my guess is that many surgeons have already started to use this technique.

As a side note: if you wish, we could provide you with PDFs of the lectures held there. As I said it is the biggest congress worldwide and the third congress will also be organized by us and held in Zurich this December. So if you think that your readers would profit from having the PDFs of the talks than I would be happy to provide them to you.

Regarding minimal thickness: we have modified the riboflavin solution in a way that we can now swell the cornea substantially. I have personally treated more than ten patients where the cornea before removal of the epithelium was 350 to 360 microns. The thinnest cornea we have treated so far was 240 microns **after** epithelial removal. After swelling of the cornea with hypotonic riboflavin solution we achieved 410 microns in this cornea and could proceed with the treatment. Another very important aspect in treating these patients is the question whether visual comfort and visual acuity with contact lenses is good enough so that crosslinking makes sense even in these advanced cases.

Let me also give you answers on the questions you raised for you FAQ list.

First question: does Crosslinking heal keratoconus?

It does not directly heal keratoconus since the underlying reasons such as genetic mutations or ocular digital manipulation are not altered. It arrests keratoconus and stops the progression.

Does Crosslinking age the cornea?

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Partially, yes. We now that with aging the natural number of crosslinks in the cornea increases. This is exactly what corneal Crosslinking with UVA light does within 30 minutes. However aging of a tissue comprises so many more metabolic and cellular processes than crosslinking alone that we do not believe that we substantially age the cornea by this surgery.

Can I perform crosslinking if I am less than 18 years old? At any age?

The youngest patient I have treated personally was eleven years old and from Kroatia. He had massive keratoconus due to permanent rubbing of the eyes. We now tend to treat patients of any age if there is keratoconus progression. Since keratoconus most often starts in puberty I have personally treated a big number of teenagers in the past twelve months.

Can I perform crosslinking if the thickness of the cornea is smaller than 400 microns?

See my answer to the question about the thin corneas. Principally, yes. The thinnest cornea we have treated so far was 340 microns with the epithelium and 240 microns without the epithelium.

Is it painful?

Principally yes. Any patients who ever had a minor scratching of the cornea due to a plant or a foreign body knows about the sensation of corneal pain. However the same pain is encountered in cosmetic refractive laser surgery in PRK. In Italy alone, thousands of patients undergo a PRK procedure every year to get rid of their glasses or contact lenses and the pain induced here is exactly the same pain as induced by crosslinking. In my eyes the pain is a small price to pay for the arrest of progression.

Can I work/perform sports after the operation?

Work: we generally tell our patients not to go to work for one week. It would not harm the eye to go working but you would soon get a headache due to blurred optics.

Regarding sports: light sports can be performed as soon as three to four days after the operation if the decreased vision acuity is not a problem. Swimming should be avoided for two weeks.

How long do I have to stay in the hospital in average?

At IROC we never hospitalize our patients for crosslinking. It is an ambulatory outpatient procedure.

How much does crosslinking cost?

The total costs are 1'400 Euro per eye for the operation as a flat rate, the preoperative examination of both eyes is 200 Euros.

Does crosslinking influence in some way the possibility to wear contact lenses?

Yes it does, but in a good way: as soon as four weeks after crosslinking you can in general wear you contact lenses again. We have observed in 40% of our patients that the cornea after crosslinking does not only stay stable but even shows a regression of the keratoconus. This process may start as early as three months after surgery and can last over three years. So, in fact, the cornea gets flatter and does even better than before surgery. But this has also an implication for the contact lens and the fit of the contact lens should be checked by a contact lens specialist every six to nine months.

I have a corneal thickness of approximately 450 microns and a stablee keratoconus for two years. Is it a good choice to perform CCL?

You should not perform crosslinking right now because the keratoconus seems to be stable. But there is a number of questions that should be answered: if you are very young (15 – 25) then there is a big chance that your keratoconus will get active again. Regular check ups (especially also of the posterior surface of the cornea) are necessary, for example every three to six months. If you would be 50 years old and show a corneal thickness of 450 microns and a stabile keratoconus for two years, I would worry much less and see you after one year.

The main indication for crosslinking is progression of keratoconus.

Finally the address that you have provided for IROC is correct and Mrs. Baggio is native Italian speaking and can help any Italian speaking patients with further questions.

Dear Mr. Annunziata, it was a pleasure to keep in touch with you and please do not hesitate to email me again in case of questions of if you want to have the PDFs of the congress transmitted.

With warm regards,

PD Dr. med. Farhad Hafezi
IROC AG